forming process. The web can be, for instance, a paper product. As stated in the present specification on page 6, the term "formation" refers to the uniformity of distribution of fibers in the sheet that is formed.

In accordance with the present invention, the method includes the steps of depositing a slurry of fibers upon a forming fabric. A light is emitted from a light source onto a first side of the wet web. The light reflected from the first side of the web is fed to a camera that forms a pattern of reflected light. A visual image is then formed of the wet web corresponding to the pattern of the reflected light.

According to the present invention, a true two-dimensional, optical image of the formed web can be produced, stored and manipulated. For instance, an operator can view the formed image and adjust various parameters in the web making system for improving the formation of the web.

In the initial Office Action, independent claim 1 was rejected under 35 U.S.C. §103 in view of Parker with or without Houston, et al. or Rule, Jr. or Bialkowski. Independent claim 12 was rejected under 35 U.S.C. §103 in view of the above same combination of references and further in view of admitted prior art allegedly contained in Applicants' own description.

As an initial matter, it should be pointed out that nothing contained in Applicants' detailed description should be construed as an admission of prior art, especially in combination with Applicants' own invention. In particular, it should be pointed out that Applicants' do not represent or admit that it would have been obvious to use a line scan camera such as the one described in the present application in a process for monitoring web formation.

Further, it is believed that the claims as now amended patentably define over the U. S. Patents cited in the Office Action. For example, the primary reference relied upon in the Office Action, Parker, fails to disclose various features and aspects of the present invention. For instance, Parker fails to disclose or suggest a method in which a visual image of a wet web is formed from reflected light. Instead, Parker discloses the use of "lookers" that merely produce signals instead of producing a true two-dimensional, optical image of the web.

For example, Parker states in column 6 that the exact design of the lookers is to some extent arbitrary and all that is required is a design which will allow detection of variations in light transmitted or reflected by the moving paper web. As stated in column 9, the signals that are produced are added or subtracted for predicting whether an unwanted variation exists in the web. As opposed to the presently claimed invention, at no time does the system in Parker create a visual image that can be examined by an operator or otherwise analyzed. As such it is believed that the claims patentably define over Parker.

It is further believed that the remaining cited references in the Office Action fail to cure the deficiencies of Parker and/or render obvious the presently pending claims.

For instance, as opposed to the presently pending claims, Rule teaches a method in which light transmission variations are detected as opposed to reflections. In this regard, as shown in Figure 1, Rule teaches placing a plurality of lights on an opposite side of a sheet as opposed to a light sensor. In the claims of the present invention, however, light is transmitted and detected from the same side of the wet web.

Similarly, Houston discloses a formation tester that requires that a strobe light be positioned on the opposite side of a paper web from a camera. Similar to Rule, when

analyzing formation, Houston teaches forming histograms using light transmission as opposed to light reflection.

The remaining reference cited in the Office Action, Bialkowski, discloses an optical sensor for determining the location of the wet line of a paper machine. Bialkowski does not disclose a method for measuring paper formation as defined in the presently pending claims and does nothing to cure the deficiencies discussed above in Parker. As such, it is believed that the claims patentably define over Bialkowski either alone or in combination with Parker, Houston and/or Rule.

In summary, it is respectfully submitted that the claims as presently pending patentably define over the prior art of record. It is believed that the present application is complete condition for allowance and favorable action, therefore, is respectfully requested. Should any issues remain after consideration of this Amendment, however, then Examiner Alvo is invited and encouraged to telephone the undersigned at his convenience.

Please charge any additional fees required by this Amendment to Deposit Account No04-1403.

Respectfully submitted,
DORITY & MANNING, P.A.

May 10, 2002
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APPENDIX A

1. (Amended) A method of measuring paper formation or distribution in a papermaking process, comprising:

(a) providing a forming fabric;

(b) depositing a paper slurry upon the forming fabric to form a wet web;

(c) transmitting light from a light source upon a first side of the wet web;

(d) reflecting the light from the first side of the wet web to a camera, thereby forming a pattern of reflected light; and

(e) forming a visual [an] image of the wet web corresponding to the pattern of the reflected light.

2. The method of claim 1 further comprising the step of moving the wet web longitudinally through the light pathway to facilitate the impingement of light upon the surface of the wet web.

3. The method of claim 1 in which the light source comprises a light line.

4. The method of claim 1 in which there are at least two independent sources of light.

5. The method of claim 1 in which the step of forming an image further comprises receiving the reflected light in a line scan camera.

6. The method of claim 5 in which the camera operates at a speed of at least about 50,000 Hz.

7. The method of claim 6 in which pixels are generated in forming the image.

8. The method of claim 7 in which the web comprises a water content of at least about 80% water during the reflecting step.

9. The method of claim 8 in which the web comprises a water content of between about 80% to about 95%.

10. The method of claim 2 in which the wet web moves at a speed of at least about 4000 feet/minute.

11. The method of claim 10 in which the forming fabric is black in color.

12. (Amended) A method [system] for measuring paper formation in real time [using apparatus for] on a papermaking process, comprising:

(a) providing a rotating forming fabric having an upper and lower surface;

(b) depositing a paper slurry [deposited] upon the upper surface of the forming fabric to establish a wet paper web, the wet paper web moving at a speed of at least about 4000 feet per minute;

(c) transmitting light from a light source upon the upper surface of a wet paper web;

(d) reflecting light from the upper surface of the wet paper web to a camera thereby forming a pattern of reflected light; and

(e) forming a visual [an] image of the wet paper web corresponding to the pattern of the reflected light.

13. (Amended) The [system] method of claim 12 in which the image is displayed upon a computer monitor.

14. (Amended) The [system] method of claim 12 in which the camera sends to a computer signals representing light received by the camera, further wherein the computer comprises a processor, whereby the processor of the computer compares said signals with predetermined stored values to determine the degree of deviation of the formation of the paper web from desired paper web formation values.

15. (Amended) The [system] method of claim 14 in which the processor is configured to adjust [sends feedback signals to apparatus of the papermaking system to modify] one or more papermaking parameters in real time to alter the characteristics of the wet web to cause the wet paper web to conform to desired paper web formation values.

16. (Amended) The [system] method of claim 15 in which the papermaking parameters comprise the group consisting of:

a) paper uniformity,

b) sheet water content,

c) stock impingement angle,

d) vacuum box position, and

e) forming fabric tension.

17. (Amended) The [system] method of claim 12 in which the wet web forms a paper having a weight of less than about 16 lbs/2880 ft^2.

18. (Amended) The [system] method of claim 12 in which the camera is a line scan camera, and the image formed is constructed by scanning lines of the image.

19. (Amended) The [system] method of claim 12 in which the light is transmitted from a light source upon the surface of the wet paper web at an impingement angle of between about 25 and 65 degrees.

20. (Amended) The [system] method of claim 12 in which more than one light source is employed to transmit light.

21. (Amended) The [system] method of claim 12 in which a vacuum box is employed to take water from the wet web while the wet web is moving along the surface of the rotating forming fabric.

22. (Amended) The [system] method of claim 12 in which light from the light source travels through at least one focusing lens before impinging upon the surface of the wet web.

Please add the following new claims:

23. (New) The method of claim 1, wherein the forming fabric has a dark color.

24. (New) The method of claim 12, wherein the forming fabric has a dark color.

25. (New) The method of claim 12, wherein the forming fabric comprises a black color.

26. (New) A method of measuring formation or distribution in a web forming process comprising the steps of:

providing a forming fabric;

depositing a slurry of fibers upon the forming fabric to form a wet web;

emitting light from a light source upon a first side of the wet web;

detecting reflected light from the wet web by a camera positioned in communication with the first side of the web, the camera forming a pattern of reflected light;

forming a visual image of the wet web corresponding to the pattern of the reflected light; and

based upon the formed visual image, adjusting one or more web making parameters in order to improve the web formation.

27. (New) A method as defined in claim 26, wherein the web making parameter comprises machine speed, fiber furnish blend, stock freeness, basis weight, stock impingement angle, vacuum box position, or forming fabric tension.